

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended) A method for conveying bidirectional data over a transformer comprising the steps of:

modulating an alternating current signal with outbound data;
driving a first side of the transformer with the modulated signal;
receiving the modulated signal from a second side of the transformer;
extracting outbound data from the received modulated signal using a comparator;
modulating according to inbound data the load presented to the second side of the transformer using a switch connected to ground when the alternating current signal is not modulated; and
receiving inbound data by sensing said load modulation.

2. (Original) The method of Claim 1 wherein modulating the alternating current signal with outbound data comprises switching the phase of an alternating current signal according to a serial bit stream coincident with a clock.

3. (Original) The method of Claim 1 wherein extracting outbound data comprises:
extracting a clock signal from the received modulated signal; and
sampling the received modulated signal according to the extracted clock signal.

4. (Original) The method of Claim 3 wherein extracting a clock signal comprises:
sensing transitions in the received modulated signal;
generating an independent clock signal; and
synchronizing the independent clock with the transitions.

5. (Original) The method of Claim 1 wherein modulating the load presented to the second side of the transformer comprises:

varying the impedance presented to the transformer according to a serial data stream coincident with an extracted clock signal.

6. (Original) The method of Claim 1 further comprising:
generating an analog signal according to the extracted outbound data signal; and
varying the impedance of a circuit load according to the analog signal.

7. (Original) The method of Claim 1 wherein modulating the load presented to the second side of the transformer comprises:

generating a digital value according to the voltage across a circuit load coincident with an extracted clock signal; and

varying the impedance presented to the second side of the transformer according to the digital value.

8. (Currently amended) An apparatus for conveying bidirectional data across a galvanic barrier comprising:

a signal generator;

a signal modulator for modulating with outbound data a signal produced by the signal generator;

a transformer having a first side for receiving a modulated signal from the signal modulator and a second side;

a data extractor for extracting outbound data from a modulated signal received from the second side of the transformer, the data extractor further comprising a comparator;

a transformer load modulator for modulating the load on the second side of the transformer utilizing a switch configured to be coupled to ground, according to inbound data; and

an inbound data recovery unit for determining inbound data by sensing load modulations induced by the transformer load modulator.

9. (Previously Presented) The apparatus of Claim 8 wherein the signal modulator comprises a phase modulator for altering the phase of the signal coincident with a clock.

10. (Previously Presented) The apparatus of Claim 8 wherein the data extractor comprises:

a clock extractor for extracting a clock from a received modulated signal; and
a sampling device for sampling the received modulated signal according to the extracted clock.

11. (Previously Presented) The apparatus of Claim 10 wherein the clock extractor comprises:

a controllable oscillator for generating a clock according to a control signal; and
the comparator is for generating the control signal by comparing transitions in a received modulated signal with transitions in the generated clock.

12. (Currently amended) The apparatus of Claim 8 wherein the transformer load modulator comprises:

an impedance element;
a synchronizer for synchronizing inbound data with an extracted clock signal; and
[[a]] the switch for attaching the impedance element to the second side of the transformer according to the synchronized inbound data.

13. (Previously Presented) The apparatus of Claim 8 further comprising:
a digital-to-analog converter for capable of generating an analog signal according to extracted outbound data;

a line circuit load for presenting a load to a communications channel;
an impedance element; and
an analog gate for linearly imparting the impedance element across the line circuit load according to the analog signal.

14. (Previously Presented) The apparatus of Claim 8 further comprising:
a line circuit load for presenting a load to a communications channel;
an analog-to-digital converter for generating a digital value according the voltage present across the line circuit load;

an impedance element; and
a switch for attaching the impedance element to the second side of the transformer according to the digital value.

15. (Currently amended) A system-side isolation controller comprising:
a signal generator;
a signal modulator for modulating a signal produced by the signal generator, the signal modulator comprising an exclusive OR gate and an exclusive NOR gate; and
an inbound data recovery unit for determining inbound data by sensing load modulations exhibited by a transformer, wherein the load modulations are generated using a switch coupled to ground.

16. (Previously Presented) The system-side isolation controller of Claim 15 further comprising a transformer driver for driving the transformer with the modulated signal.

17. (Currently amended) A line-side isolation controller comprising:
a data extractor for extracting outbound data from a modulated signal received from a second side of a transformer, the data extractor comprising a comparator; and
a transformer load modulator utilizing a switch coupled to ground for modulating the load presented to the second side of the transformer according to inbound data.

18. (Previously Presented) The line-side isolation controller of Claim 17 wherein the data extractor comprises:
a clock extractor for extracting a clock signal from a received modulated signal; and
a sampling device for sampling the received modulated signal according to the extracted clock signal.

19. (Previously Presented) The line-side isolation controller of Claim 18 wherein the clock extractor comprises:
a controllable oscillator for generating a clock according to a control signal; and

the comparator is for generating the control signal by comparing transitions in a received modulated signal with transitions in the generated clock.

20. (Currently amended) The line-side isolation controller of Claim 17 further comprising:

a digital-to-analog converter for generating an analog signal according to extracted outbound data;

an analog gate for linearly imparting a first impedance element across a line circuit load according to the analog signal;

an analog-to-digital converter for generating a digital value according the voltage present across the line circuit load;

an impedance element; and

[[a]] **the** switch configured for attaching a second impedance element of the second side of the transformer to ground according to the digital value.